

U.S. ARMY

**Center for
Army
Analysis**

**POSSIBLE RAPID ASSESSMENT AND INITIAL DETECTION
SITINGS - 2**

APRIL 2001



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13. ABSTRACT (Maximum 200 Words) The PRAIDS-2 report was conducted to provide a list of possible siting locations for additional Rapid Assessment and Initial Detection (RAID) Teams within the United States using geographic information systems to provide a rational locating plan based upon: population density, aggregate populations, proximity to existing teams, and existing National Guard Facilities.			
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POSSIBLE RAPID ASSESSMENT AND INITIAL DETECTION SITINGS - 2 (PRAIDS-2**SUMMARY**

THE PROJECT PURPOSE is as follows. The end of the Cold War has dramatically altered the number and kinds of threats the United States will face in the future. The two-dimensional threat (nuclear attack and conventional invasion of Western Europe) posed by the Soviet Union has been replaced by numerous antagonists: "rogue states," terrorist organizations (internal and external), and unstable individuals. Coupled with ever-increasing threats has been the proliferation of technology capable of delivering a highly destructive weapon to a target in the US with little detection. This threat has led to the determination that the US must develop a way of responding to an attack on a major urban area. The purpose of the PRAIDS-2 study is to help develop a rational siting plan where an additional five Weapons of Mass Destruction-Civilian Support Teams (WMD-CST) should be located.

THE PROJECT SPONSOR is the Directorate of Army Manpower, Office of the Deputy Chief of Staff for Operations and Plans (DAMO-ODC), Headquarters, Department of the Army (HQDA).

THE PROJECT OBJECTIVES were to:

- (1) Determine a possible siting plan for five Weapons of Mass Destruction-Civilian Support Teams within the United States.
- (2) Provide a detailed breakdown on the population within 150 miles of each potential site.

THE SCOPE OF THE PROJECT was firmly established by the rules for site selection as dictated by the sponsor.

- Five sites would be chosen.
- Sites would only be considered in states not already having a team
 - Sites would be limited to CONUS
 - Current population figures would be used

THE MAIN ASSUMPTION was that the criteria provided by the sponsor limited the site locations by specifying that only existing National Guard facilities could be used and that only states not already having or scheduled to receive a WMD-CST would be considered. The next step in the process was the actual analysis using the ArcView suite of software. The software allows geospatial data to be queried in many different ways. In this instance, population data (1990 US Census) were used to determine the best candidate locations for the five additional WMD-CST sites. Then, using the list of available National Guard facilities, the best locations

for the WMD-CSTs were determined, selecting those that provided the greatest net population coverage within a 150-mile radius of an available National Guard facility.

THE PRINCIPAL FINDING is that the addition of the five recommended sites will ensure that 85.2 percent of the total US population and 115 of the 120 most populous urban areas will be within 150 miles of a WMD-CST. The five sites selected are (1) Camp Atterbury, IN, (2) Grand Rapids, MI, (3) Selma, AL, (4) Wasau, WI, and (5) Roseburg, OR.

THE PROJECT EFFORT was conducted by Mr. Mark Ricks, Resource Analysis Division, Center for Army Analysis (CAA).

COMMENTS AND QUESTIONS may be sent to the Director, Center for Army Analysis, ATTN: CSCA-RA, 6001 Goethals Road, Suite 102, Fort Belvoir, VA 22060-5230.

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1 POSSIBLE RAPID ASSESSMENT AND INITIAL DETECTION SITINGS - 2

1.1 Introduction

The end of the Cold War has dramatically altered the kinds of threats the United States will face in the coming years. The two-dimensional threat (nuclear attack and conventional invasion of Western Europe) posed by the Soviet Union has been replaced by numerous antagonists: "rogue states," terrorist organizations (internal and external), and unstable individuals. Coupled with the ever-increasing threats has been the proliferation of technology capable of delivering a highly destructive weapon to a target within the US with little detection.

The National Military Strategy (December 1999) addresses the risks posed by organizations equipped with weapons of mass destruction (WMD) when it states:

"Our potential enemies, whether nations or terrorists, may be more likely in the future to resort to attacks against vulnerable civilian targets in the United States. At the same time, easier access to sophisticated technology means that the destructive power available to rogue nations and terrorists is greater than ever."

Ideally, the best course of action would be to prevent a WMD attack on a US city. In fact, an important focus of the US intelligence community is on possible domestic terrorism. But as the Oklahoma City and World Trade Center bombings demonstrated, it is not always possible to prevent a determined individual or group from carrying out their plans. Sadly, it may no longer be a question of if, but when, in regard to WMD being used within the United States. This threat realization has led to the creation of specially trained teams (formerly referred to as Rapid Assessment and Initial Detection (RAID) Teams, now referred to as WMD-Civilian Support Teams (WMD-CST)) within the National Guard Bureau to manage federal and local assets in the event of a WMD attack on a US civilian target.

The PRAIDS-2 study will be used to help develop a rational siting plan where an additional five Weapons of Mass Destruction-Civilian Support Teams (WMD-CST) should be located.

1.2 Background

The WMD-CST units are being developed within the National Guard Bureau (NGB) to offer a way of responding to a biological/chemical attack on a US civilian target. The units will have extensive training in detection of hazardous agents and crisis response (medical decontamination, security, and command facilities). The units will augment civilian authorities in the event of an attack on a US civilian target.

The Deputy Chief of Staff for Operations and Plans (DAMO-ODC) took responsibility for the fielding of the units. Beginning in fiscal year (FY) 99, 10 WMD-CST units were established in 10 different states. Two Center for Army Analysis (CAA) study efforts aided in the site

selection: GBASE (Graphically-Based Analysis System-Enhanced) and ERTAG (Examination of RAID Team Alternatives Using GBASE). The 10 initial locations for the units were as follows:

Los Alamitos, CA	Ft. Leonard Wood, MO
Aurora, CO	Scotia, NY
Marietta, GA	Ft. Indiantown Gap, PA
Peoria, IL	Austin, TX
Natick, MA	Tacoma, WA

FY 2000 saw the activation of another six units in the following locations:

Anchorage, AK	Honolulu, HI
Sacramento, CA	Mansfield, OH
St. Augustine, FL	Ft. Lee, VA

The initial PRAIDS (February 2000) study effort used a slightly different methodology from the ERTAG and GBASE studies to determine the initial 16 units. These 11 teams were to be stood up over a 3-year period starting with 4 teams in FY 01, then 5 teams in FY 02, and finally 2 teams in FY 03 for a total of 27 WMD-CSTs. The PRAIDS study recommended the following sites:

FY 2001

Minneapolis-St. Paul, MN
Ft. Jackson, SC
Baton Rouge, LA
Phoenix, AZ

FY 2002

Little Rock, AR
Louisville, KY
Council Bluffs, IA
Bangor, ME
Albuquerque, NM

FY 2003

Oklahoma City, OK
Pocatello, ID

1.3 Planned Locations

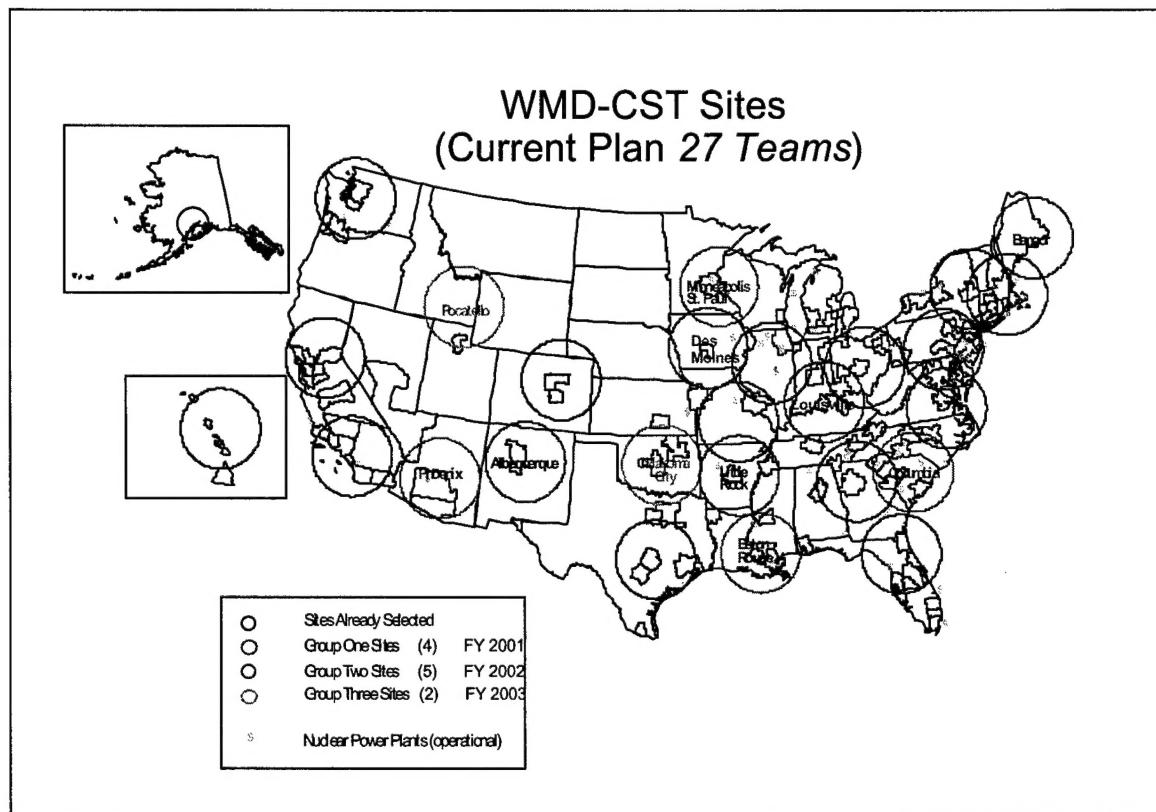


Figure 1. Planned Locations

Figure 1 depicts the current and planned locations for the WMD-CST units as previously stated. The circles represent the response area (150 miles) for each unit as provided by the sponsor. The circles are also color-coded to correspond to the fiscal year in which the teams will be activated (black – 16 teams already activated, red – four in FY 01, blue – five in FY 02, green – two in FY 03).

1.4 Purpose and Objectives

The purpose of the PRAIDS-2 study was to determine the best locations for five additional WMD-CST teams. The final selections had to be deduced within the framework of two key factors. First, the solution had to provide the best overall increase in population coverage (the greatest net in population). Second, the sites could not be located in states already having a WMD Civilian Support Team.

1.5 Constraints and Assumptions

The process operated under several assumptions. In general, the sponsor, reflecting the wishes of the US Congress stipulated the obvious constraints: (1) only five sites were to be selected, and (2) sites must make use of existing National Guard facilities (no new money for new construction).

Another key assumption used throughout the analysis was that a WMD-CST site could respond out to a 150-mile radius. This assumption was determined by the sponsor to be the distance that a team could reach in 4 hours (1 hour to gather equipment and 3 hours to travel). The 150-mile radius may not be accurate for all sites due to differences in terrain, transportation networks, and other limiting factors.

1.6 Approach

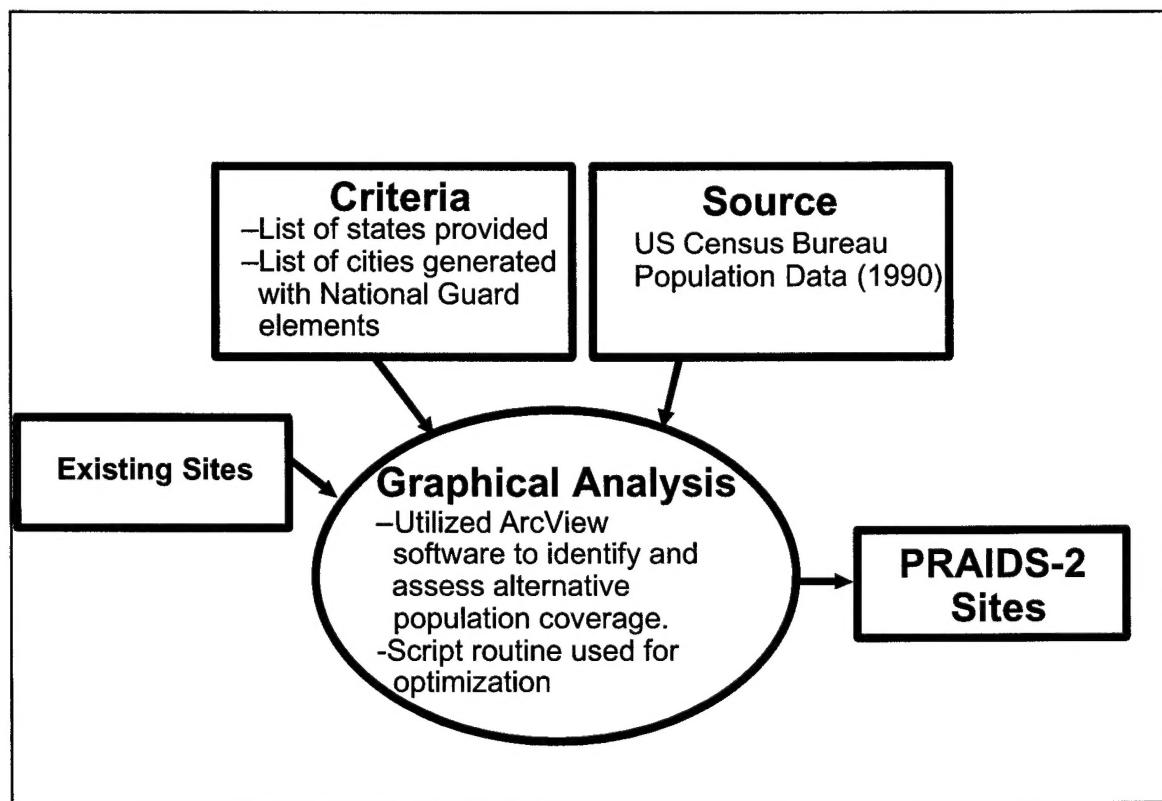


Figure 2. Approach

The analytical approach used in this report is graphically illustrated in Figure 2. The criteria provided by the sponsor limited the site locations by specifying that only existing National Guard

facilities could be used and that only states not already having or scheduled to receive a WMD-CST would be considered. These constraining factors narrowed the search considerably.

The next step in the process was the actual analysis using the ArcView suite of software. The software allows geospatial data to be queried in many different ways. In this instance, population data (1990 US Census) were used to determine the best candidate locations for the five additional WMD-CST sites. Then, using the list of available National Guard facilities, the best locations for the WMD-CSTs were determined, selecting those that provided the greatest net population coverage within a 150-mile radius of an available National Guard facility.

1.7 Results

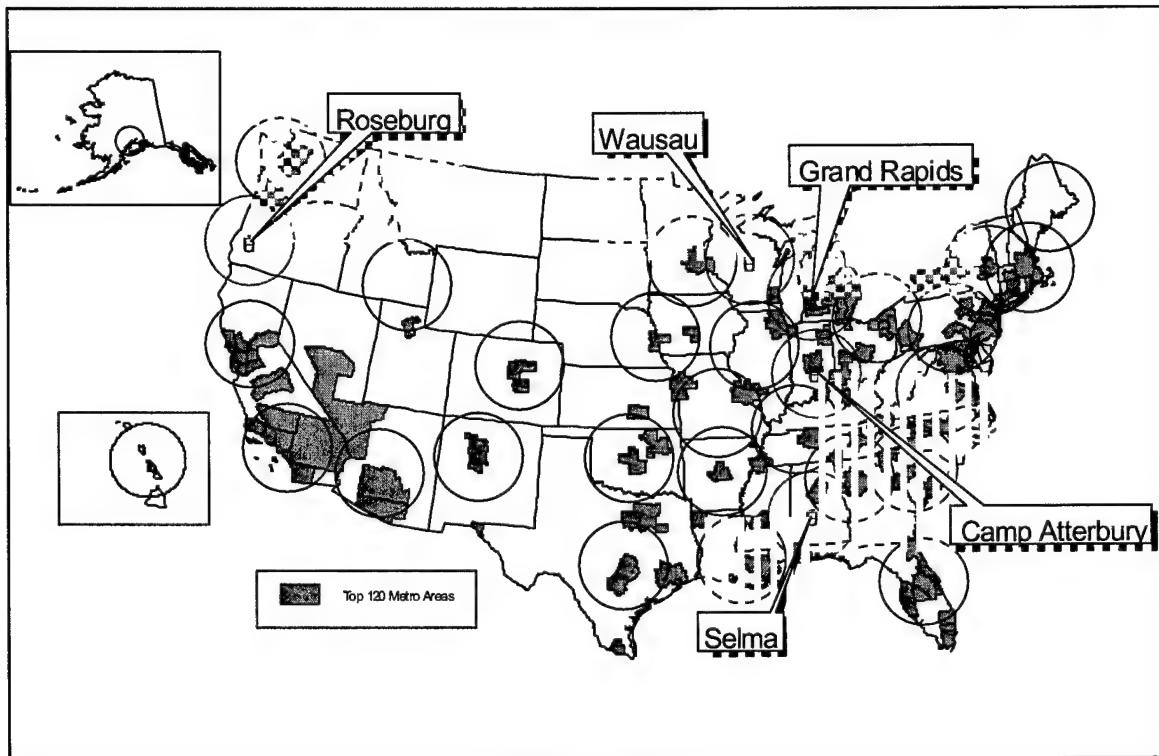


Figure 3. Results

The results are shown graphically in Figure 3. The greater concentration of teams in the eastern half of the continental United States results from the fact that the US population is more greatly concentrated in the same areas. This population distribution can be discerned from the map above by noting where the Metropolitan Statistical Areas (MSAs--shaded in green) are located. The MSAs represent the urban areas of the United States as determined by the US Census Bureau.

The coverage of the top 120 MSAs was not a driving consideration for the PRAIDS-2 study; however, MSA coverage does provide an interesting factor to examine. The coverage of MSAs

could be considered an important factor if it is assumed that population concentrations represent 125 MSAs. attractive targets for a WMD attack. The PRAIDS-2 plan provides at least partial coverage for 115 of the top 120 MSAs.

1.8 Output Analysis, State Population (tabular)

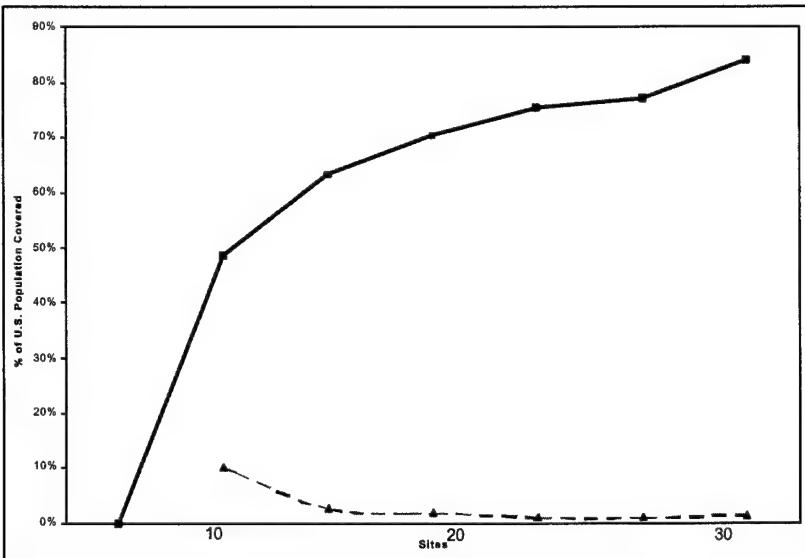
State	1990 State Population	Current Plan		PRAIDS-2 Plan					
		State Population Covered	Percentage of State Covered	Sites	Regional Net	State Net	Outside of State Increase	State Population Coverage	% of State Population Covered
IN	5,544,159	1,410,055	25.4%	Camp Atterbury	7,579,827	3,495,653	4,084,174	4,905,708	88.5%
MI	9,295,297	5,174,018	55.7%	Grand Rapids	6,968,130	3,538,917	3,429,213	8,712,935	93.7%
AL	4,040,587	2,685,247	66.5%	Selma	2,595,578	1,274,781	1,320,797	3,960,028	98.0%
WI	4,891,789	1,062,453	21.7%	Wausau	2,509,743	1,979,585	530,158	3,042,038	62.2%
OR	2,842,321	228,788	8.0%	Roseburg	1,375,721	1,284,467	91,254	1,513,255	53.2%

***Covered means population within 150-mile radius of a site**

Figure 4. Output Analysis, State Population (tabular)

The data can be examined in various ways. The regional net population coverage was the key criterion used to determine the best sites, but state population figures can also provide interesting insights into how the sites provide coverage to a state in which a site is located. The table above provides the regional and state population figures for each prospective site. The order of the sites in Figure 4 represents the greatest net increase to the smallest when read top to bottom.

1.9 Output Analysis, US Population (graph)



First 27 sites used distance and population while PRAIDS-2 used strictly population

—	Population Covered by all sites
- - -	Average Percentage of US Population covered per site

*Covered means population within 150-mile radius of a site

Figure 5. Output Analysis, US Population (graph)

Figure 5 represents a graphic depiction of the net population coverage trend for the original 27 sites and the proposed PRAIDS-2 sites. Moving from left to right, the graph generally follows a path of a gradual flattening. The earlier sites provide greater return as measured by the population within 150 miles of each site. As additional sites are added, the marginal return diminishes (the line flattens) as each site is added until the PRAIDS-2 sites are added, at which point there is a sudden spike in the chart caused by the change in siting considerations used in PRAIDS-2.

The earlier studies examined how best to cover the entire US assuming the final number of sites would be the number of sites being considered for that study. This has led to a deviation from the optimum plan each time there has been an additional team (or teams) added. The PRAIDS-2 plan is an attempt to provide a strict population criterion in the selection process. It will allow a better rationale for team site selections if additional teams are proposed in the future.

1.10 Output Analysis, Entire US Population

	Entire US population	Covered by 27 sites	Percent covered, 27 sites	Cum coverage w/added site	Cum percent covered
Camp				199,075,87	80.0%
Grand Rapids				206,044,00	82.8%
Selma				208,639,57	83.9%
Wausau				210,619,16	84.7%
Rosebur				211,994,88	85.2%

Figure 6. Output Analysis, Entire US Population

The impact of PRAIDS-2 on the entire US population is shown in Figure 6. This figure provides some of the numbers underlying the graph on the previous page (Figure 5). The reduction in the return in each site can be seen by the smaller population increase for each additional site. The increase from the previous 27 sites to site 28, the Camp Atterbury site, is a 3 percent increase in the total US population covered, while the increase from the 31st site to the 32nd site is only a .5 percent increase in the US population covered.

1.11 Observations

Population covered by the full 32 WMD-CST sites - 211,995,000 (85.2% of total US population) (*information based upon US Census Bureau 1990 Census Tracts with coverage assumed to be 150-mile radius of each site*).

Provides an increase of 20,499,000 people covered and an increase from 77% of the US population to 85.2% of the population covered.

115 of the of the largest 120 Metropolitan Statistical Areas are at least partially within 150 miles of a RAID site.

Increase in 6 MSAs over the current plan.

Some areas may not have coverage out to 150 miles.

Physical terrain and highway networks may make a 150- mile radius unrealistic for some locations.

150-mile radius from Grand Rapids includes part of Wisconsin across Lake Michigan.

Figure 7. Observations

The overall impact of the five additional sites is a net increase of 20,499,000 people within 150 miles of a WMD-CST site. The total US population within 150 miles of a site is 211,995,000 (85.2 percent); 115 of the largest 120 MSAs will be within 150 miles of a WMD-CST site with the addition of the 5 sites.

One issue that has existed throughout the site selection process is the question of "realism" in the 150-mile radius. The 150-mile radius was selected to represent the distance a team could deploy in 4 hours--1 hour of preparation and 3 hours of travel time. This radius is reasonable for most sites, although there are some exceptions. There may be cases in which physical barriers or other impediments to travel may reduce the response distance a team can reasonably reach in 4 hours. An example of this is the placement of a team in Grand Rapids. The 150-mile radius stretches across Lake Michigan to include a small portion of Wisconsin that may not be within a 4-hour deployment radius if the mode of transportation is limited to a motor vehicle.

APPENDIX A PROJECT CONTRIBUTORS

1. PROJECT TEAM

a. Project Director

Mr. Mark Ricks, Resource Analysis Division

2. PRODUCT REVIEW

Dr. Ralph E. Johnson, Quality Assurance

Ms. Nancy M. Lawrence, Mission Support

3. EXTERNAL CONTRIBUTORS

MAJ John Grote, Deputy Chief of Staff for Operations and Plans (DAMO-ODC)

COL Jay Steinmetz, Deputy Chief of Staff for Operations and Plans (DAMO-ODC)

APPENDIX B REQUEST FOR ANALYTICAL SUPPORT

P *Performing Division:* RA

Account Number: 2000173

A *Tasking:* Verbal

Mode (Contract-Yes/No): No

R *Acronym:* PRAIDS-2

T

Title: Possible Rapid Assessment and Initial Detection Sitings - 2

1 *Start Date:* 05-Jun-00

Estimated Completion Date:

05-Oct-00

Requestor/Sponsor (i.e., DCSOPS): DCSOPS, DA *Sponsor Division:* DAMO-ODC

Resource Estimates: a. *Estimated PSM:* 3 b. *Estimated Funds:* \$0.00

c. *Models to be used:*

Description/Abstract:

To evaluate alternative cities for possible Weapons of Mass Destruction-Civilian Support Teams (WMD-CST) that provide the greatest population coverage within a 150-mile radius of each site and minimize overlapping coverage with the 27 existing/selected sites.

Study Director/POC Signature: Original Signed

Phone#: 703-806-5383

Study Director/POC: Mr. Mark Ricks

If this Request is for an External Project expected to consume 6 PSM or more, Part 2 Information is Not Required. See Chap 3 of the Project Directors' Guide for preparation of a Formal Project Directive.

Background:

P

A

R *Scope:*

T

2

Issues:

Milestones:

Signatures *Division Chief Signature:* Original Signed and Dated

Date:

Division Chief Concurrence: Original Signed

Sponsor Signature: Original Signed and Dated

Date:

Sponsor Concurrence (COL/DA Div Chief/GO/SES)

